THE NEW

GENERAL ELECTRIC RADIAL WIRING SYSTEM

DISTRIBUTORS

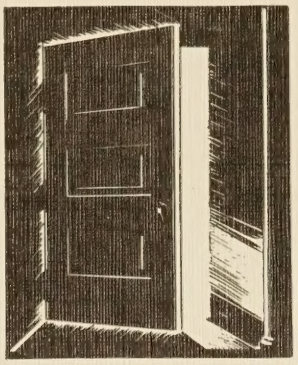
Ala., Birmingham—Matthews Electric Supply Co.
Ala., Montgomery—Matthews Electric Supply Co.
Ariz., Phoenix—G-E Supply Corporation
Cal., Fresno—G-E Supply Corporation
Cal., Long Beach—G-E Supply Corporation
Cal., Los Angeles—G-E Supply Corporation
Cal., Oakland—G-E Supply Corporation
Cal., Sacramento—G-E Supply Corporation
Cal., San Diego—G-E Supply Corporation
Cal., San Francisco—G-E Supply Corporation
Colo., Denver—G-E Supply Corporation
Colo., Denver—Hendrie & Bolthoff Mfg. & Sup. Co.
Colo., Pueblo—Hendrie & Bolthoff Mfg. & Sup. Co.
Conn., Bridgeport—G-E Supply Corporation
Conn., Hartford—G-E Supply Corporation
Conn., New Haven—G-E Supply Corporation
Conn., Waterbury—G-E Supply Corporation
D. C., Washington—National Electrical Supply Co.
Fla., Jacksonville—G-E Supply Corporation
Fla., Miami—G-E Supply Corporation
Fla., Tampa—G-E Supply Corporation
Ga., Atlanta—G-E Supply Corporation
Ga., Savannah—G-E Supply Corporation
Idaho, Boise—G-E Supply Corporation
Ill., Chicago—G-E Supply Corporation and branches
Ill., Chicago—Metropolitan Electrical Supply Co.
Ill., Peoria—Universal Electric Co.
Ill., Quincy—Crescent Electric Supply Co.
Ill., Rockford—G-E Supply Corporation
Ill., Springfield—G-E Supply Corporation
Ind., Evansville—G-E Supply Corporation
Ind., Fort Wayne—Protective Electric Supply Co.
Ind., Indianapolis—G-E Supply Corporation
Ind., Muncie—G-E Supply Corp.
Ind., Richmond—Richmond Electric Co.
Ind., South Bend—South Bend Electric Co.
Ind., Terre Haute—Advance Electric Co.
Ia., Burlington—Crescent Electric Supply Co.
Ia., Cedar Rapids—Crescent Electric Supply Co.
Ia., Davenport—Crescent Electric Supply Co.
Ia., Des Moines—G-E Supply Corporation
Ia., Dubuque—Crescent Electric Supply Co.
Ia., Sioux City—G-E Supply Corporation
Ia., Waterloo—Crescent Electric Supply Co.
Kan., Wichita—Sutton Electric Supply Co.
Ky., Louisville—G-E Supply Corporation
La., New Orleans—G-E Supply Corporation
La., Shreveport—G-E Supply Corporation
Me., Bangor—G-E Supply Corporation
Me., Portland—G-E Supply Corporation
Md., Baltimore—G-E Supply Corporation
Mass., Boston—G-E Supply Corporation
Mass., Boston—Milhender, Afes Electrical Co.
Mass., Lynn—Des Roberts Elec'l Sup. Co.
Mass., New Bedford—Mendell Electric Supply Co., Inc.
Mass., Springfield—G-E Supply Corporation
Mass., Worcester—G-E Supply Corporation
Mich., Battle Creek—Central Electric Supply Co.
Mich., Detroit—G-E Supply Corporation
Mich., Detroit—Frank C. Teal Company
Mich., Grand Rapids—G-E Supply Corporation
Mich., Kalamazoo—G-E Supply Corporation
Mich., Lansing—G-E Supply Corporation
Mich., Muskegon—Fitzpatrick Electric Supply Co.
Minn., Duluth—G-E Supply Corporation
Minn., Minneapolis—G-E Supply Corporation
Minn., Minneapolis—Peerless Elec'l Co.
Minn., St. Paul—G-E Supply Corporation
Miss., Jackson—G-E Supply Corporation
Mo., Joplin—G-E Supply Corporation
Mo., Kansas City—G-E Supply Corporation
Mo., St. Louis—G-E Supply Corporation and branches
Mont., Billings—G-E Supply Corporation
Mont., Butte—G-E Supply Corporation
Neb., Omaha—G-E Supply Corporation
N. H., Manchester—G-E Supply Corporation
N. J., Jersey City—G-E Supply Corporation
N. J., Newark—G-E Supply Corporation
N. J., Paterson—G-E Supply Corporation
N. Y., Albany—Havens Electric Company
N. Y., Binghamton—Southern Tier Elec. Supply Co.
N. Y., Buffalo—G-E Supply Corporation
N. Y., Elmira—Southern Tier Electric Supply Co.
N. Y., New Rochelle—Royal Eastern Elec. Supply Co.
N. Y., New York—G-E Supply Corp. and branches
N. Y., New York—E. B. Latham Co.
N. Y., New York—Royal Eastern Elec. Supply Co.
(also Borough of Brooklyn and Long Island City)
N. Y., Niagara Falls—G-E Supply Corporation
N. Y., Poughkeepsie—Electra Supply Co., Inc.
N. Y., Rochester—G-E Supply Corporation
N. Y., Syracuse—Langdon & Hughes Electric Co.
N. Y., Utica—Langdon & Hughes Electric Co.
N. C., Charlotte—G-E Supply Corporation
N. C., Raleigh—G-E Supply Corporation
N. Dak., Fargo—Dakota Electric Supply Co.
N. Mex., Albuquerque—Hendrie & Bolthoff Mfg. & Sup. Co
O., Akron—G-E Supply Corporation
O., Canton—Furbay-Summer Electric Co.
O., Cincinnati—G-E Supply Corporation
O., Cleveland—G-E Supply Corporation
O., Columbus—G-E Supply Corporation
O., Dayton—G-E Supply Corporation
O., Toledo—G-E Supply Corporation
O., Youngstown—G-E Supply Corporation
O., Zanesville—The Roekel Co.
Okla., Oklahoma City—G-E Supply Corporation
Okla., Tulsa—G-E Supply Corporation
Ore., Portland—G-E Supply Corporation
Pa., Allentown—G-E Supply Corporation
Pa., Erie—G-E Supply Corporation
Pa., Harrisburg—Raub Supply Co.
Pa., Lancaster—Raub Supply Co.
Pa., Philadelphia—G-E Supply Corporation
Pa., Philadelphia—Elliott-Lewis Electrical Co., Inc.
Pa., Pittsburgh—G-E Supply Corporation
Pa., Reading—G-E Supply Corporation
Pa., Scranton—G-E Supply Corporation
Pa., Wilkes-Barre—Raub Supply Co.
Pa., Williamsport—Lowry Electric Co., Inc.
R. I., Providence—G-E Supply Corporation
S. C., Columbia—Perry-Mann Electric Company
S. D., Deadwood—Hendrie & Bolthoff Mfg. & Sup. Co.
Tenn., Chattanooga—G-E Supply Corporation
Tenn., Knoxville—G-E Supply Corporation
Tenn., Memphis—G-E Supply Corporation
Tenn., Nashville—G-E Supply Corporation
Texas, Abilene—G-E Supply Corporation
Texas, Amarillo—G-E Supply Corporation
Texas, Dallas—G-E Supply Corporation
Texas, El Paso—G-E Supply Corporation
Texas, Ft. Worth—G-E Supply Corporation
Texas, Houston—G-E Supply Corporation
Texas, San Antonio—G-E Supply Corporation
Utah, Salt Lake City—G-E Supply Corporation
Va., Norfolk—G-E Supply Corporation
Va., Richmond—G-E Supply Corporation
Wash., Seattle—G-E Supply Corporation
Wash., Spokane—G-E Supply Corporation
Wash., Tacoma—Home Electric Company
W. Va., Bluefield—Bluefield Supply Co.
W. Va., Charleston—Virginian Electric, Inc.
W. Va., Wheeling—Gee Electric Company
Wis., Appleton—G-E Supply Corporation
Wis., La Crosse—G-E Supply Corporation
Wis., Madison—Crescent Electric Supply Company
Wis., Milwaukee—G-E Supply Corporation

ADEQUATE HOME WIRING

The New

GENERAL ELECTRIC

Radial Wiring System



THE additional use of appliances and electrical equipment in homes, imposes new duties on the wiring system. With this demand for an adequate wiring plan in mind, General Electric engineers developed the G-E Radial Wiring System.

Here is a system which will easily assure enough copper and outlets for all modern conveniences without materially increasing the cost of the wiring. A control plan is used which saves long circuit runs and makes each circuit of the system independent. Riser feeders terminate at circuit breakers from which branch circuits are divided into separate radial runs. Economies are effected and the overloading of circuits is prevented. Additions to the system may be easily and economically made at any future date.

This Radial Wiring System is the logical development in the evolution of wiring which in each phase of electrical history has striven to meet the new demands.

The Evolution of Wiring

In the early days of the use of electricity, the wiring system was prepared only for light. Soon came rapid improvements in switching for the control of this light. Outlets were required only for lighting purposes.

In the second period, lighting was enhanced by new portable attractive fixtures designed to eliminate light glare, and to provide decorative lighting arrangement. Thus arose the need for more fixed outlets from the circuits, and most important, for an increased number of accessible "convenience" or "plugging-in" outlets. It was in these years that the electrical industry started to use the word "adequacy."

In the third period, more outlets were demanded not only for lighting but for current-consuming appliances—the fan, the vacuum cleaner and hair curler, to name a few. "Adequacy" jumped into more common use. In the more modern period of the years, 1928 and 1929, "adequacy" became a by-word with all of us, but it implied only the number of outlets. The number of outlets per circuit and the number of circuits had not seriously concerned us as yet. "Adequacy" had not included the meaning of copper size.

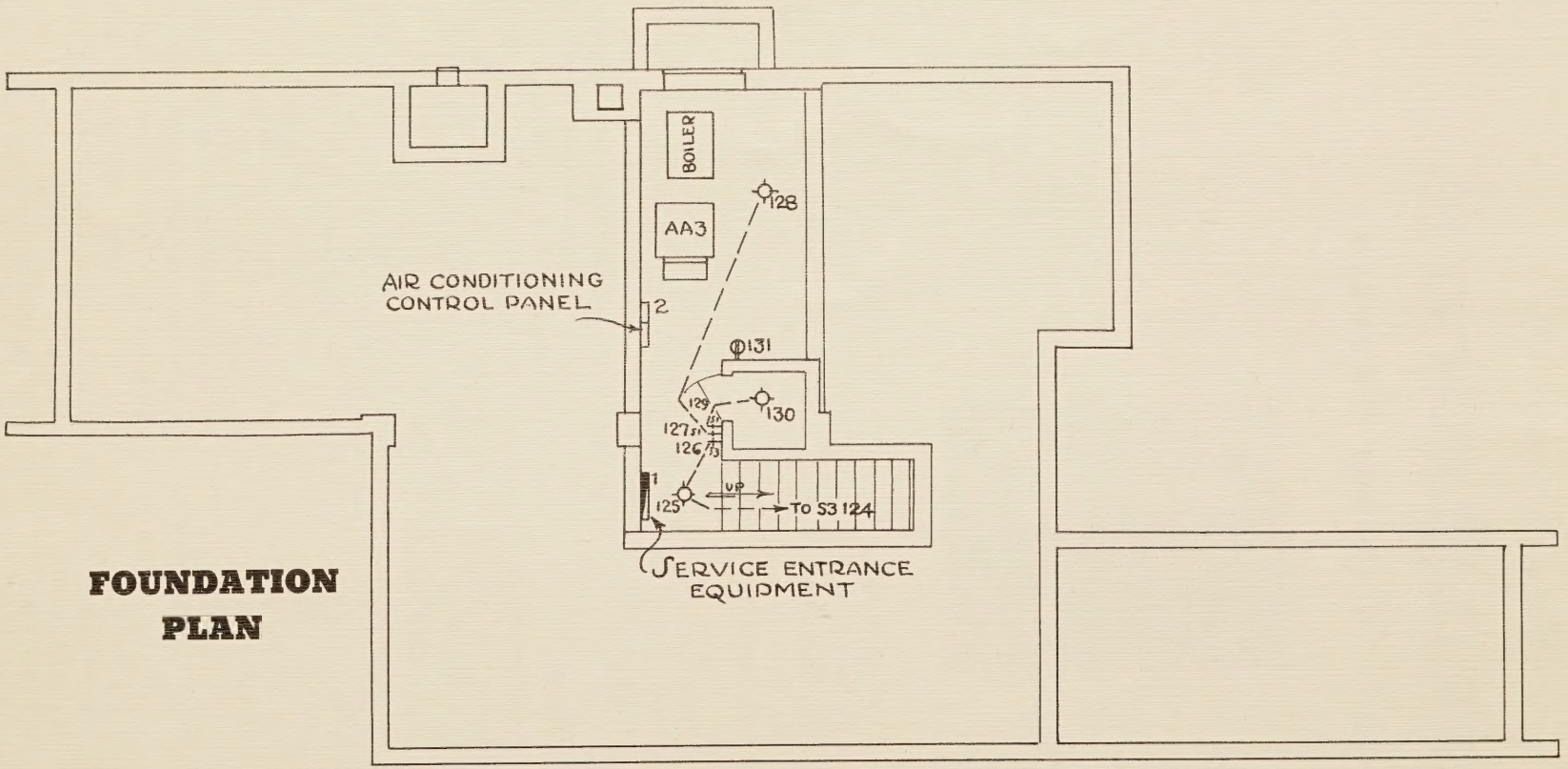
At the fourth stage of electrical development, there were many more motorized appliances and consequently, home owners began to complain of light "flicker" and poor or dull lights. Circuits were overloaded. Copper sizes were too small.

Then "adequacy" took on a new meaning—which has become more serious as appliances have created greater loading demands. Attempts have been made to overcome lack of copper "adequacy" by adding special and isolated circuits for the heavier capacity appliances. This has, to some extent, helped the problem, but it has been expensive to all concerned. If the method cured the trouble for the future, the expense would have been justified, but such was not the case. These special demand circuits place heavy copper for the isolated use of those devices, but leave the rest of the system just as "inadequate" as before. Appliances are being placed on the shelf because they cannot be used; not because there is a lack of outlets, but because the wiring system design in copper is inadequate.

Much has been spoken and written about outlet adequacy but very little attention has been paid to the size of the wires which serve these outlets. Yet copper adequacy is even more important than outlet adequacy, for of what use is an outlet if current can't get through to it without losses?

The Radial Wiring System furnishes adequacy both in outlets and in copper. The slight additional cost of ample copper is returned many times over by the saving of two distinct losses—loss in heat and loss in power. Such losses are continuous and must be paid for as registered on the meter.

Consumer satisfaction will be greatly increased by the working speed and efficiency of appliances that are receiving the voltage for which they were designed.



FOUNDATION PLAN

Circuit "B"—from Service Equipment No. 1 to (three No. 10 conductor) Air Conditioner Panel No. 2.

Sub-circuit B_1—Two No. 12 wire, 110-volt circuit from No. 2 to the Conditioner motor.

Sub-circuit B_2—Same as above except from No. 2 to back-pressure control of the condenser unit.

Sub-circuit B_3—Same as above except 220-volt from No. 2 to the condensing motor.

Sub-circuit B_4—One 3-wire, low-voltage circuit from No. 2 to gas furnace.

Sub-circuit B_5—One 4-wire, low-voltage circuit from No. 2 to thermo control.

Sub-circuit B_6—One 2-wire, low-voltage circuit from No. 2 to Air Conditioner Solenoid Valve.

Sub-circuit B_7—One 2-wire, low-voltage circuit from No. 2 to Humidistat.

Circuit "D"—See First Floor Plan.

Sub-circuit D_1—from No. 11 includes No. 124-125-126-127-128-129-130-131.

SERVICE ENTRANCE EQUIPMENT

No. 1—Service entrance cable shall be of three No. 4 conductor, or their equivalent capacity. If single-phase, 3-wire, 220-110-volt service is used, Trumbull Electric Company's Combination Entrance and Service Switch, Cat. 2924-0 shall be used.

124 3-way Switch GE-2514 to control No. 125 ceiling light.

125 Ceiling light.

126 Combination 3-way switch and 2 single-pole switches. GE-2916—No. 126 controls No. 125 ceiling light and

127 Same except No. 127 controls No. 128 ceiling light, Cat. GE-1292.

128 Ceiling light.

129 Same as No. 126 and No. 127 except controls No. 130 ceiling light.

130 Ceiling light.

131 Convenience outlet GE-2679.

Today's period in electrical history finds the development of electrical home appliances and apparatus far ahead of home wiring. The G-E New American home program makes demands for current that present types of home wiring are inadequate to supply. A kw connected load ten times that of 1928 is required. In 1928 a connected load of 3 kw was common while the modern electrical home of today has a 30-kw connected load in fixed appliances alone.

Modern Requirements Demand New Methods

Obviously, the electrical wiring system required for such loads cannot be ten times as large as that for a 3-kw load. Therefore the system must be carefully laid out using all modern developments with full consideration of home operating habits and demands. Old practices must be discarded and new engineering methods for home wiring must be applied. This is done in General Electric's new Radial Wiring System. The plan, which employs methods long used in commercial and industrial fields, is made possible for residential wiring because of new devices, new designs and applications to finished products which provide controls throughout the home which heretofore have been impossible to use.

In the following description of the Radial Wiring System as applied to one of the prize "New American" Homes* sponsored by the General Electric Company note the completeness of the electrical equipment and how simply and efficiently the Wiring System serves it. Note how the wiring makes possible the full enjoyment by the tenant of all of today's many electrical comforts and conveniences—from air conditioning to curling irons. Note the economy of the system and the ease with which it can be enlarged at any future time.

Truly the Radial Wiring System provides adequacy that has never been known before, provides the type of wiring the modern electrical home must have, provides present and future flexibility in use and maintenance.

**The plans for the homes in the New American Home Program were selected from the prize-winning designs in the General Electric "Home Electric" architectural competition.*

Wiring for "New American" Home

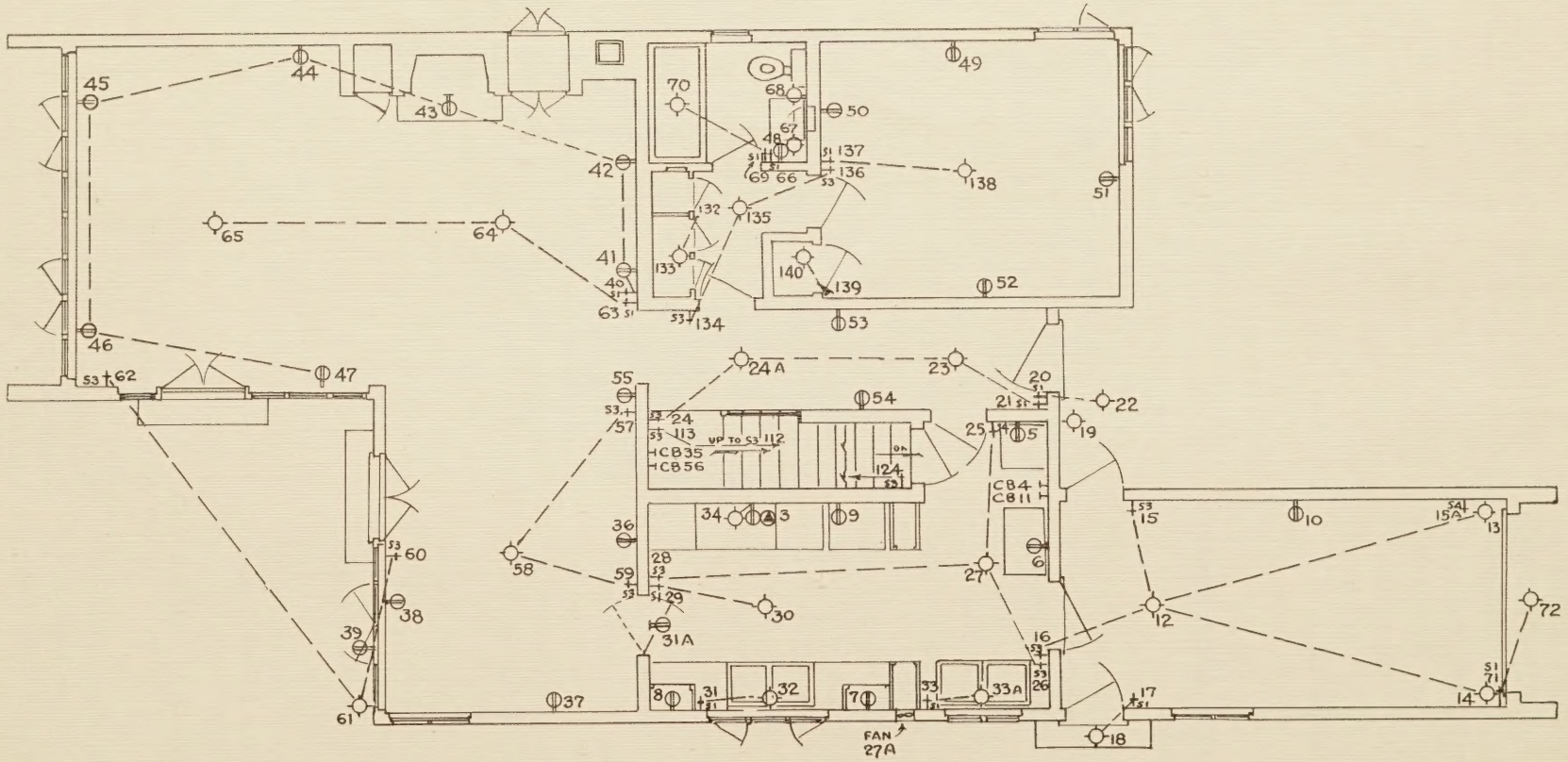
The design presented here is that of the grand prize home. The specifications call for a completely modern electric home, including complete air conditioning together with air cooling, and an all-electric kitchen with electric range and water heater. The wiring system not only is adequate for the major fixed appliances but includes a complete outlet and lighting plan with modern switching. There are about one hundred and forty 110-volt outlets, ninety-two current-consuming and forty-eight wall and door switches. In addition, there are low-voltage signals, controls, radio, etc.

Minimum equivalents of three No. 4 service conductors, three No. 8 conductors for a combination range and water heater circuit, two No. 10 conductors for sub-feeder circuits, and two No. 12 conductors for branch circuits are required. Sub-feeders with control-center design of circuits distributed throughout the house have been selected, as well as branch-circuit outlet grouping arrangement.

In developing the electrical drawings, each outlet, whether current-consuming or switch control, has been numbered upon the floor plan. With each floor plan a descriptive schedule is given of all these numbered outlets in consecutive order. It will be noted that the General Electric catalog number of each wiring device is thus definitely established for each item beyond question of doubt, either as to function, grade or quantity. Above the individual description of outlets are listed the specific sub-circuits upon which the outlets are to be grouped, and also to which circuit breaker these sub-circuits are to be routed.

Since the program for the "New American" Home is nation-wide, under varied climates, methods of heating, service facilities, rate bases, and general residence wiring practice, a broad specification was adopted that would also cover various choices of house plans.

The general specifications for the house require that all work be installed in accordance with the National Electrical Code, and as approved by the local inspection bureaus. A choice of any approved wiring materials desired is available. The same latitude was written into the materials required for service and meter service equipment, so as to cover underground services as well as overhead. The types of outlet boxes, fittings, circuit breakers, panelboards, device plates, and all other items that are not specifically numbered upon the drawings, have likewise been given General Electric identification.



FIRST FLOOR PLAN

Circuit "A" — from Service Equipment No. 1 to Electric Range No. 3. Electric water heater is to be placed on same circuit as the electric range, to be controlled by Automatic Peak Limiter, Cat. Y-121.

Circuit "C" — from Service Equipment No. 1 to 20-ampere Circuit Breaker* No. 4.

Sub-circuit C_1—from No. 4 to No. 5.
Sub-circuit C_2—from No. 4 to No. 6.
Sub-circuit C_3—from No. 4 to No. 7.
Sub-circuit C_4—from No. 4 to No. 8.
Sub-circuit C_5—from No. 4 to No. 9.
Sub-circuit C_6—from No. 4 to No. 10.
Sub-circuit C_7—from No. 4 to No. 34.

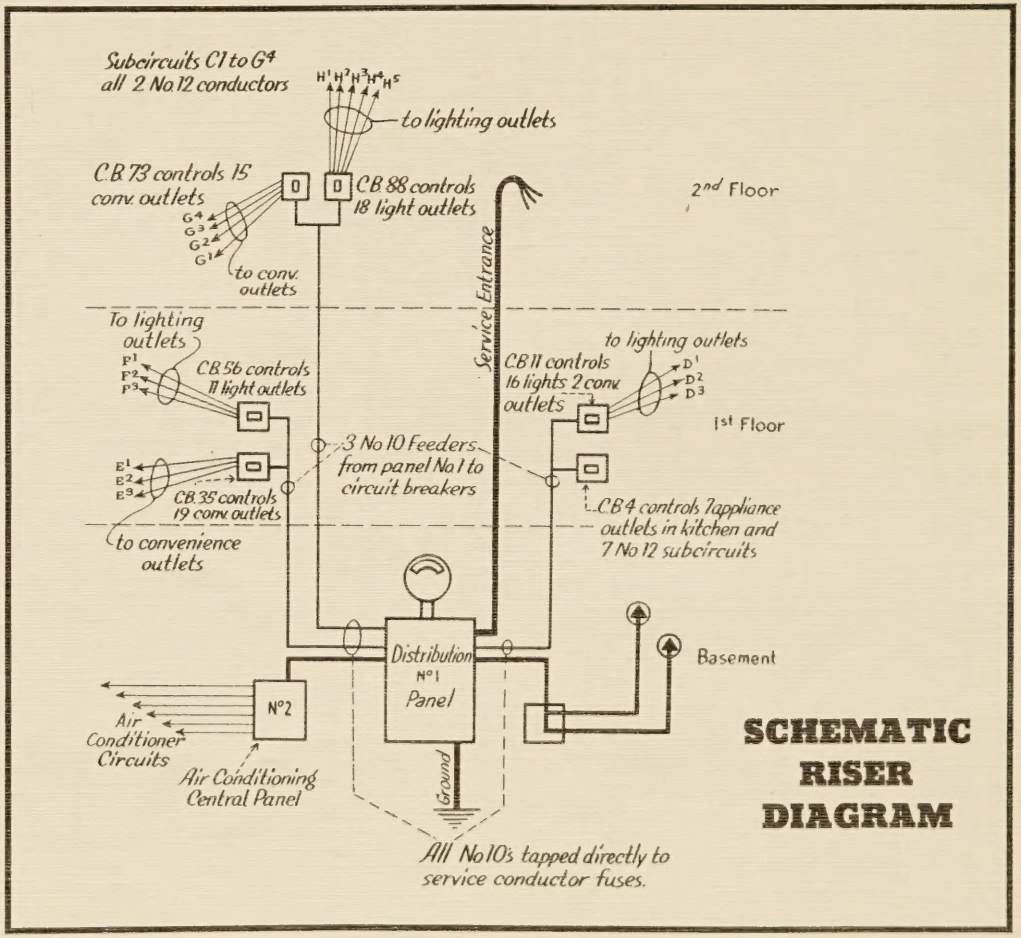
Circuit "D" — from Service Equipment No. 1 to 15-ampere Circuit Breaker* No. 11.
Sub-circuit D_1 from No. 11 includes No. 12-13-14-15-15A-16-17-18-71-72.
Sub-circuit D_2 from No. 11 includes No. 19-20-21-22-23-24-24A.
Sub-circuit D_3 from No. 11 includes No. 25-26-27-28-29-30-31-31A-32-33-33A-27A.
Sub-circuit D_4 from No. 11 includes No. 124-125-126-127-128-129-130-131.

Circuit "E" — from Service Equipment No. 1 to 20-ampere Circuit Breaker* No. 35.
Sub-circuit E_1 from No. 35 includes No. 36-37-38-39-55.
Sub-circuit E_2 from No. 35 includes No. 40-41-42-43-44-45-46-47.
Sub-circuit E_3 from No. 35 includes No. 48-49-50-51-52-53-54.

Circuit "F" — from Service Equipment No. 1 to 15-ampere Circuit Breaker* No. 56.
Sub-circuit F_1 from No. 56 includes No. 57-58-59-60-61-62.
Sub-circuit F_2 from No. 56 includes No. 63-64-65.
Sub-circuit F_3 from No. 56 includes No. 66-67-68-69-70-132-133-134-135-136-137-138-139-140.

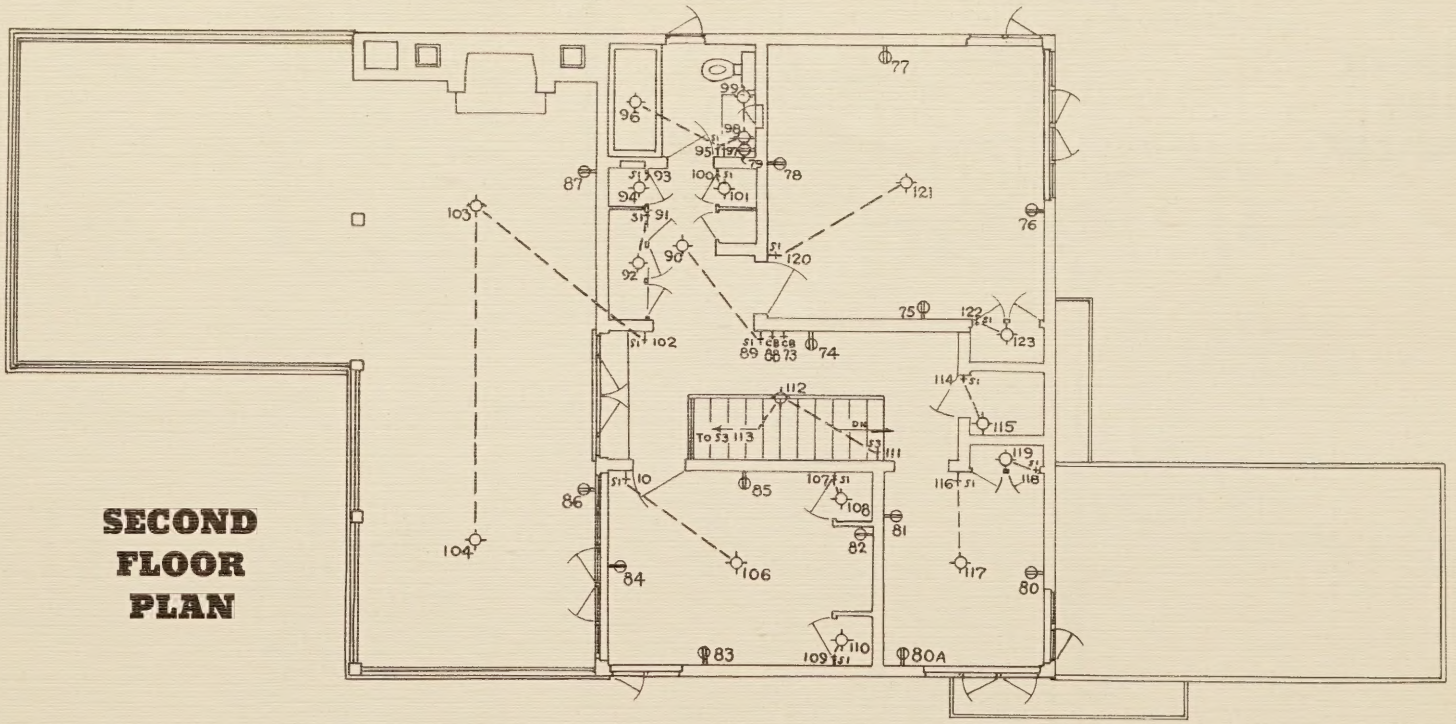
4 20-amp single-pole Circuit Breaker*—Cat. GB-120 to be mounted in Gang Outlet Box with No. 11 and Brass Plate.
5 Convenience outlet GE-2679.
6 Convenience outlet GE-2679.
7 Convenience outlet GE-2679.
8 Convenience outlet GE-2679.
9 Convenience outlet GE-2679.
10 Convenience outlet GE-2679.
11 15-amp single-pole Circuit Breaker*—GB-115 to be mounted in Gang Outlet Box with No. 4 and Brass Plate.
12 Ceiling light in garage.
13 Side wall outlet in garage.
14 Side wall outlet in garage.
15 3-way Switch GE-2515 controls ceiling outlet No. 12—GE-2514.
15A 4-way Switch GE-2515.
16 (2) 3-way Switches GE-2911, one to control ceiling light No. 12, other to control ceiling light No. 27.
17 Single-pole Switch GE-2841, controls outside wall bracket No. 18.
18 Outside wall bracket.
19 Side wall outlet for house number.
20 (1) Single-pole Switch and
21 (1) 3-way Switch in combination GE-2909—No. 20 to control outside fixture No. 22 and No. 21 to control No. 23 and No. 24A ceiling fixture.
22 Outside bracket.
23 Ceiling fixture.
24 (2) 3-way Switches GE-& 2911—No. 24 to control
113 Ceiling light No. 23 and No. 24A and No. 113 to control ceiling light No. 112.
25 4-way Switch GE-2515 controls ceiling light No. 27.
26 Same as No. 16 above.
27 Ceiling light.
27A Fan.
28 (1) 3-way and (1) single-pole Switch GE-2909. No. 28 controls ceiling light No. 27 and
29 No. 29 controls ceiling light No. 30.
30 Ceiling light.
31 Single-pole Switch GE-2841 controls side wall fixture No. 32.
31A Clock outlet GE-2942.
32 Side wall fixture.
33 Single-pole Switch controls No. 33A side wall ceiling outlet.
33A Side wall outlet.
34 Combination convenience outlet and wall bracket.
35 Circuit Breaker* 20-amp single-pole, GB-120 to be mounted in Gang Outlet Box with No. 56 and Brass Plate.
36 Twin convenience outlet GE-2679.
37 Twin convenience outlet GE-2679.
38 Twin convenience outlet GE-2679.
39 Convenience outlet GE-2959.
40 20-amp single-pole Switch GE-2843 to control one side of convenience outlet GE-2901, No. 41 to No. 47 inclusive.
41 to
47 (Inclusive)—GE-2901 Convenience outlets, one side to be controlled by Switch No. 40 and other side to be directly on an uninterrupted circuit.
48 Convenience outlet GE-2679.
49 Convenience outlet GE-2679.
50 Convenience outlet GE-2679.
51 Convenience outlet GE-2679.
52 Convenience outlet GE-2679.
53 Convenience outlet GE-2679.
54 Convenience outlet GE-2679.
55 Convenience outlet GE-2679.
56 15-amp single-pole Circuit Breaker* GB-115 to be mounted in Gang Outlet Box with No. 35 and Brass Plate.
57 3-way Switch GE-2514 controls No. 58 ceiling light.
58 Ceiling light.
59 Same as No. 57 above.
60 3-way Switch controls No. 61 outdoor wall bracket.
61 Outdoor wall bracket.
62 Same as No. 60 above.
63 Single-pole Switch GE-2841 controls No. 64 and No. 65 ceiling lights.
64 Ceiling light.
65 Ceiling light.
66 (2) Single-pole combination Switches GE-2907—No. 66 to control wall brackets No. 67 and No. 68.
67 Wall bracket.
68 Wall bracket.
69 Same as No. 66 except to control No. 70 ceiling fixture.
132 Single-pole door switch GE-273 controls No. 133 ceiling light.
133 Ceiling light.
134 3-way Switch GE-2514 controls No. 135 ceiling light.
135 Ceiling light.
136 3-way and single-pole combination Switch GE-2902—No. 136 controls No. 135 ceiling light, and No. 137.
137 Controls No. 138 ceiling light.
138 Ceiling light.
139 Door Switch GE-273 controls ceiling light No. 140.
140 Ceiling light.

*An alternate to Circuit Breaker shall be Trumbull Electric Company's Enclosed Branch Circuit Residence Panel, 3-wire, 4-circuit, Cat. No. 3104.



This is one method of applying the Radial Wiring System. Other methods are possible for every particular application.

SECOND FLOOR PLAN



Circuit "G"—from Service Equipment No. 1 to 20 Amp. Circuit Breaker* No. 73.
Sub-circuit G_1—from No. 73 includes No. 74-75-76-77-78-79.
Sub-circuit G_2—from No. 73 includes No. 80A-80-81.
Sub-circuit G_3—from No. 73 includes No. 82-83-84-85.
Sub-circuit G_4—from No. 73 includes No. 86-87.
Circuit "H"—from Service Equipment No. 1 to 15 Amp. Circuit Breaker* No. 88.
Sub-circuit H_1—from No. 88 includes No. 89-90-91-92-93-94-95-96-97-98-99-100-101.
Sub-circuit H_2—from No. 88 includes No. 102-103-104.
Sub-circuit H_3—from No. 88 includes No. 105-106-107-108-109-110.
Sub-circuit H_4—from No. 88 includes No. 111-112-113-114-115-116-117-118-119.
Sub-circuit H_5—from No. 88 includes No. 120-121-122-123.
73 20 Amp. single-pole Circuit Breaker* GB-120 to be mounted in Gang Outlet Box with No. 88 and Brass Plate.
74 to 87 (Inclusive)—Twin Convenience outlets, GE-2679.
88 15 Amp. single-pole Circuit Breaker.* GB-115 to be mounted in Gang Outlet Box with No. 73 and Brass Plate.
89 Single-pole Switch GE-2841 controls No. 90 ceiling light.
90 Ceiling light.
91 Door Switch GE-273 controls closet light No. 92.
92 Closet light.
93 Door Switch GE-273 controls closet light No. 94.
94 Closet light.
95 and 97 (2) single-pole switches in combination GE-2907 controlling ceiling light No. 96 and wall lights No. 98 and No. 99.
96 Ceiling light.
98 Wall light.
99 Wall light.
100 Door Switch GE-273 controls closet light No. 101.
101 Closet light.
102 Single-pole Switch Cat. GE-284 controls ceiling lights No. 103 and No. 104.
103 Ceiling light.
104 Ceiling light.
105 Single-pole Switch GE-2841 controls ceiling light No. 106.
106 Ceiling light.
107 Door Switch GE-273 controls ceiling light No. 108.
108 Ceiling light.
109 Same as No. 107 except controls ceiling light No. 110.
110 Ceiling light.
111 3-way Switch GE-2514 controls ceiling light No. 112.
112 Ceiling light.
113 See No. 24.
114 Door Switch GE-273 controls closet light No. 115.
115 Closet light.
116 Single-pole Switch GE-2841 controls ceiling light No. 117.
117 Ceiling light.
118 Door Switch GE-273 controls closet light No. 119.
119 Closet light.
120 Single-pole Switch GE-2841 controls ceiling light No. 121.
121 Ceiling light.
122 Door Switch GE-273 controls closet light No. 123.
123 Closet light.

*An alternate to Circuit Breaker shall be Trumbull Electric Company's Enclosed Branch Residence Panel, 3-wire, 4-circuit, Cat. No. 3104.

Decentralized Distribution

The conventional panelboard and feeder layout has given way in the "New American" Homes to a system of sub-feeders which connect to flush branch circuit breakers at various load-center locations in the house. Thus branch circuit panelboards, and the usual feeder distribution panel at the meter-service equipment center are dispensed with. A new system of decentralized distribution is proposed which warrants close study and analysis.

Based on section 806-d, paragraph 3, of the National Electrical Code, No. 10 conductors are connected through the main fuses which protect the No. 4 service conductors at the meter board. These No. 10 sub-feeders, which are limited to not over 25 ft in length by the foregoing Code rule, terminate at breakers protecting 15 amp lighting, and 20 amp receptacle branch circuits. From each circuit breaker, the branch circuits are divided into separate radial runs of two No. 12 wires. While such various runs as connect to one breaker are actually one branch circuit, these separate radial runs have been termed sub-circuits.

Radial Circuiting

The accompanying schematic diagram shows the approximate placing of breakers in pairs, on the first floor and on the second floor. This diagram indicates three No. 10 wires feeding each pair of breakers after these feeders have been tapped within the service switch cabinet. It will be noted that there is no feeder distribution panelboard in the basement, because, as stated above, the No. 10 conductors which feed the lighting and receptacle circuit breakers, are dependent upon the main service fuses for overcurrent protection.

An air-conditioning control panel, from which the motor circuit and several 110-volt and several low-voltage runs are taken to the air-conditioning equipment, is likewise fed with No. 10 wire. The only sub-feeder which is fused at the meter board supplies the range and water heater. A limiter device in the water-heater circuit prevents its use while the range is in full operation.

Further study of the schematic diagram discloses the use of 15-amp and 20-amp branch circuits for serving more than 12 outlets per circuit. It will be noted that section 2010-a of the 1933 Code, permits more than twelve residence outlets per circuit, provided that in addition to any appliance branch circuits, at least one 15-amp branch circuit is installed for each 500 sq ft of floor area. The layout provides six branch circuits, for an area of about 1900 sq ft.

An alternate has been included in the layouts that permits the substitution of 4-circuit plug-fuse-type residence panels in case the flush-circuit breakers are not used.

Circuit-breaker locations are centered to minimize all circuit lengths. Likewise, the convenience outlets have nearly all been circuited separately from the lighting outlets. This combination of sub-feeders and radial branch-circuits has not increased material quantities and labor costs over the conventional panelboard layout. Any increase in cost that may be incurred due to increased sizes of copper must be evaluated in relation to the improvement which is brought about in outlet voltages under future load demands.

Rewiring Advantages

The sub-circuiting of branch circuits into radial runs may offer a further advantage if any remodeling, alterations or additions should be made at some future time. The problem of breaking into a limited branch-circuit, and its re-routing or extension should prove more simple than where a long concealed run must be revamped to suit changes.

Services which require larger than No. 4's could not be tapped with No. 10's. Since No. 10, rated at 25 amp is less than one-third the rated capacity of No. 2 (90 amp), or No. 1 (100 amp), such a service would require a slightly modified but not expensive design. No. 8's could be tapped to either of the above sizes, or instead of increasing the tap feeders to No. 8, a 60-amp sub-fuse at the meter board, in multiple with the range water heater sub-fuse, would lower the protective device rating to where the No. 10's would again be permissible. If, with this latter layout, another sub-fuse were provided for the air-conditioner panel, the system would then be ideally separated to permit the emergency isolation of (1) cooking, (2) air conditioning, or (3) lighting. For localities where separate rate inducements are available on particular types of load, the later sub-division would enable full advantage to be taken of all these inducements.

Kitchen Circuiting Design

The reduction of voltage loss and the diversity of conductor loading involves a new kitchen circuiting design. Seven appliance outlets are protected by one 20-amp circuit breaker which is served by a No. 10 feeder circuit. Separate runs or sub-circuits, each consisting of No. 12 wires, are fanned out from this breaker to the various appliance outlets, without further overcurrent protective devices. This radial layout prevents any portion of a No. 12 run from becoming sub-

jected to the load of more than one outlet. The use of this distribution or circuiting method offers a diversity of outlet loading (up to the 20-amp breaker capacity), without the possibility of voltage losses that might result from inadequate circuit copper.

Since each outlet has been placed on its own run, or sub-circuit of No. 12, which leads back to the breaker, further breaker units may be added for protecting a particular outlet, or group of outlets. For instance, any one of the seven No. 12 runs to appliance outlets could at any time be transferred to a separate additional breaker.

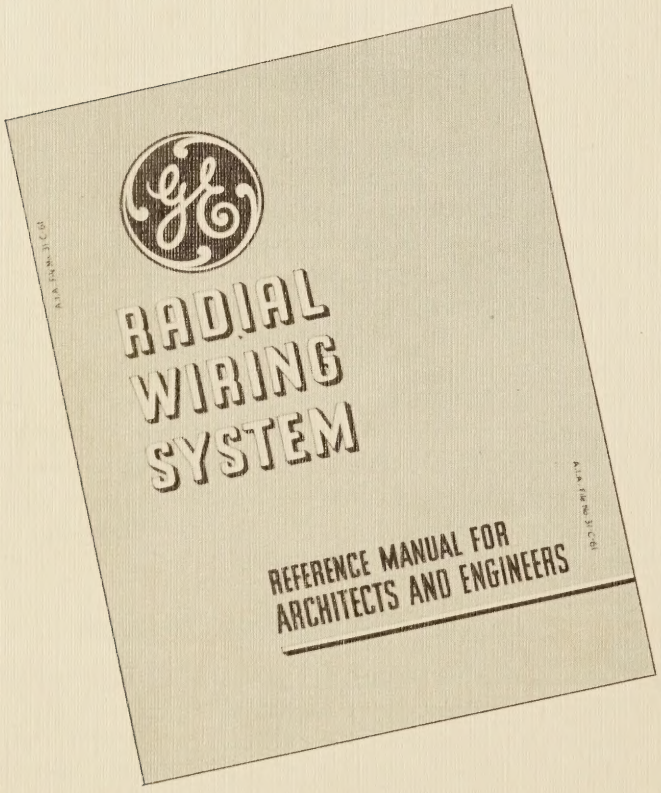
Likewise, another circuit of No. 10 could later be installed in the basement to an additional breaker in the kitchen and connected to any of the seven No. 12 sub-circuits that it might be desirable to take away from the present No. 10 circuit and its 20-amp breaker.

From a mechanical standpoint, the radial sub-circuit system, involving No. 12 wire runs which dead-end at single outlets, simplifies the wire forming, connecting and splicing problem within the various appliance outlet boxes. This should also permit the easy installation of future outlets.

The Public Wants Results

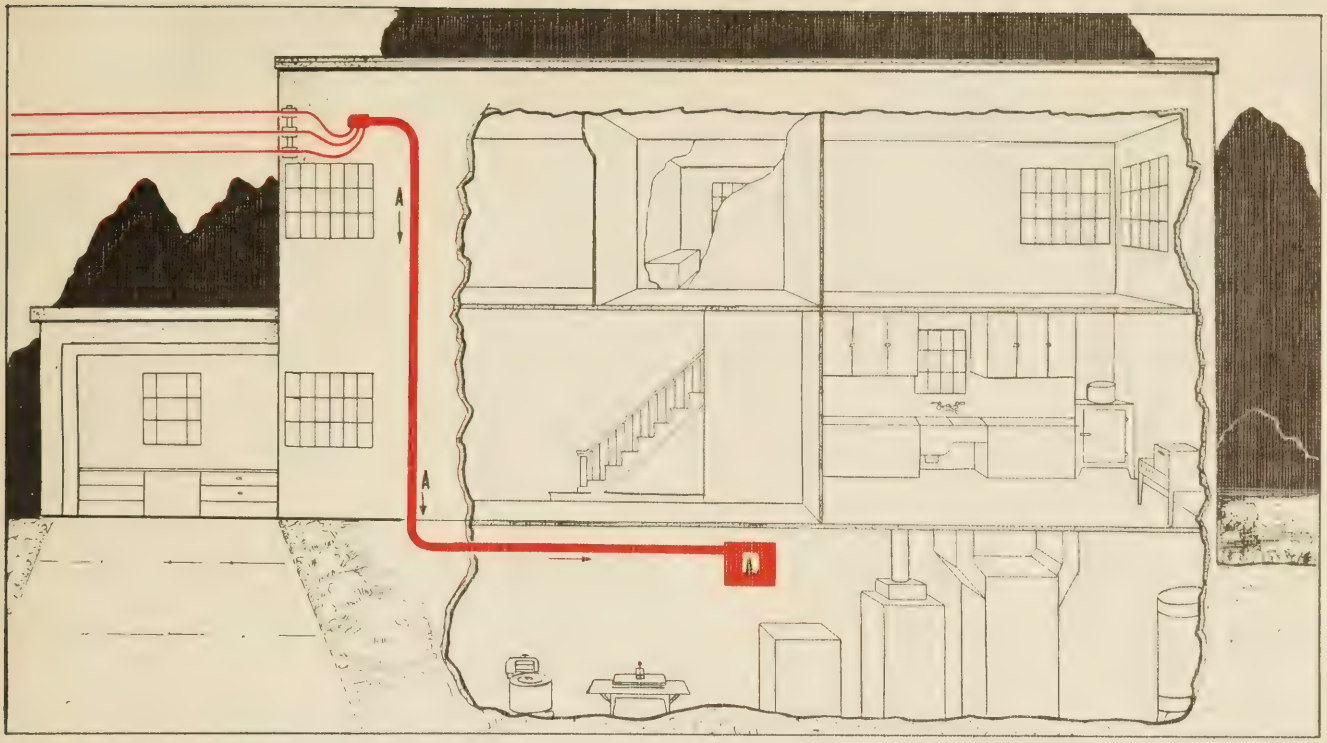
Home owners want the benefits to be derived from modern electrical equipment. They may not know or care how current is brought to the equipment. But they want continuous service from it and depend on the contractor, architect or engineer to take care of details. Possibly at some future time the public will understand more fully the technical problem behind the enjoyment of electrical comfort and convenience.

In the meantime professional reputation will stand or fall on the finished efficiency and livability of the homes that are designed. This certainly provides incentive for widespread adoption of the Radial Wiring System with its guaranty of full electrical comfort.

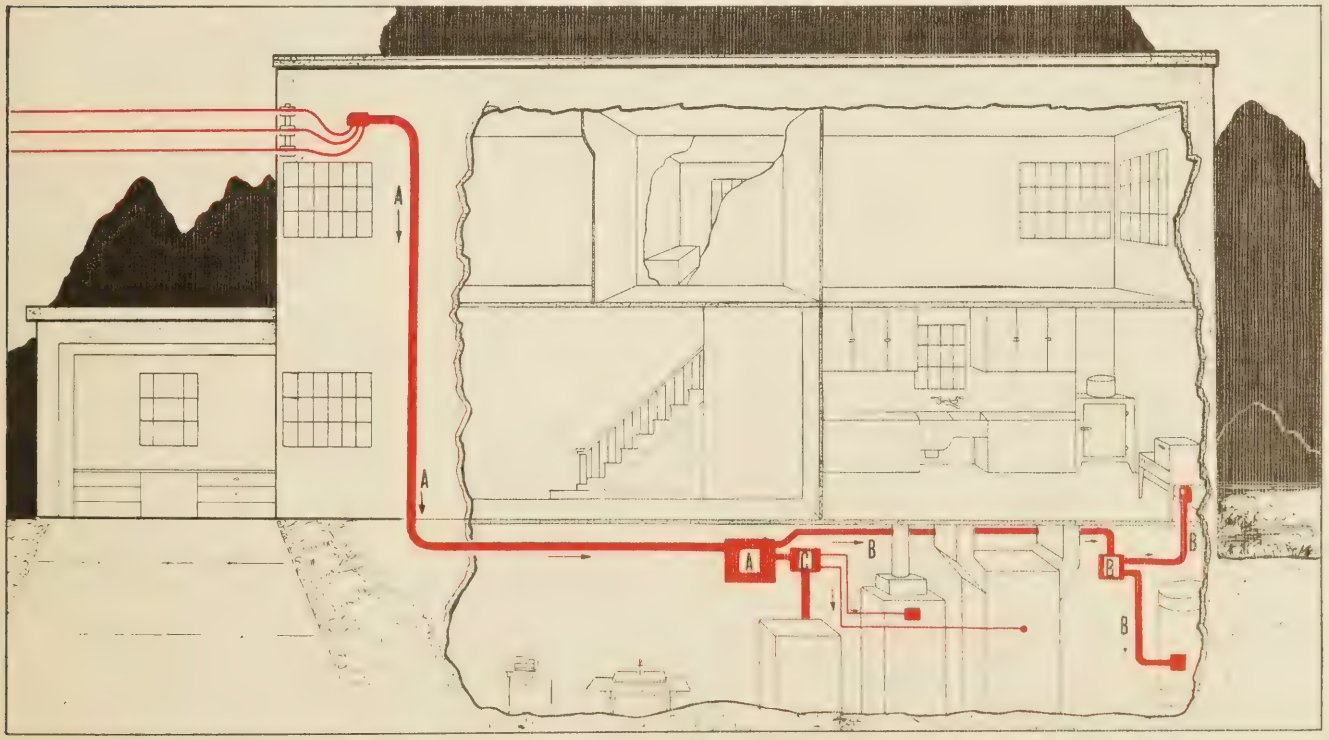


THE G-E RADIAL WIRING SYSTEM MANUAL

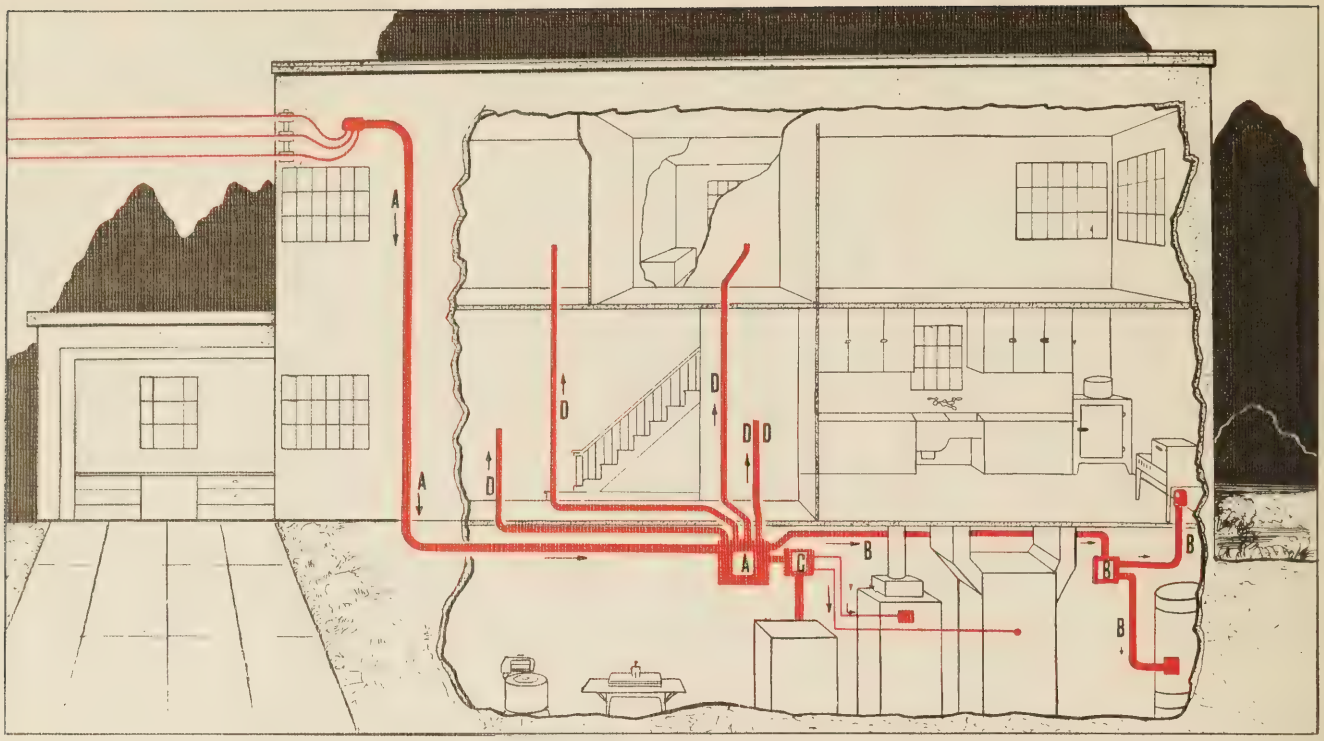
This manual enables specifications to be written for a G-E Radial Wiring System easily and quickly for any type or size of home. Sizes and quantities of material as well as Catalog Numbers are given to aid in designing the right wiring plan for any desired purpose. Write for your copy to Section 51534, Appliance and Merchandise Department, General Electric Company, Bridgeport, Connecticut.



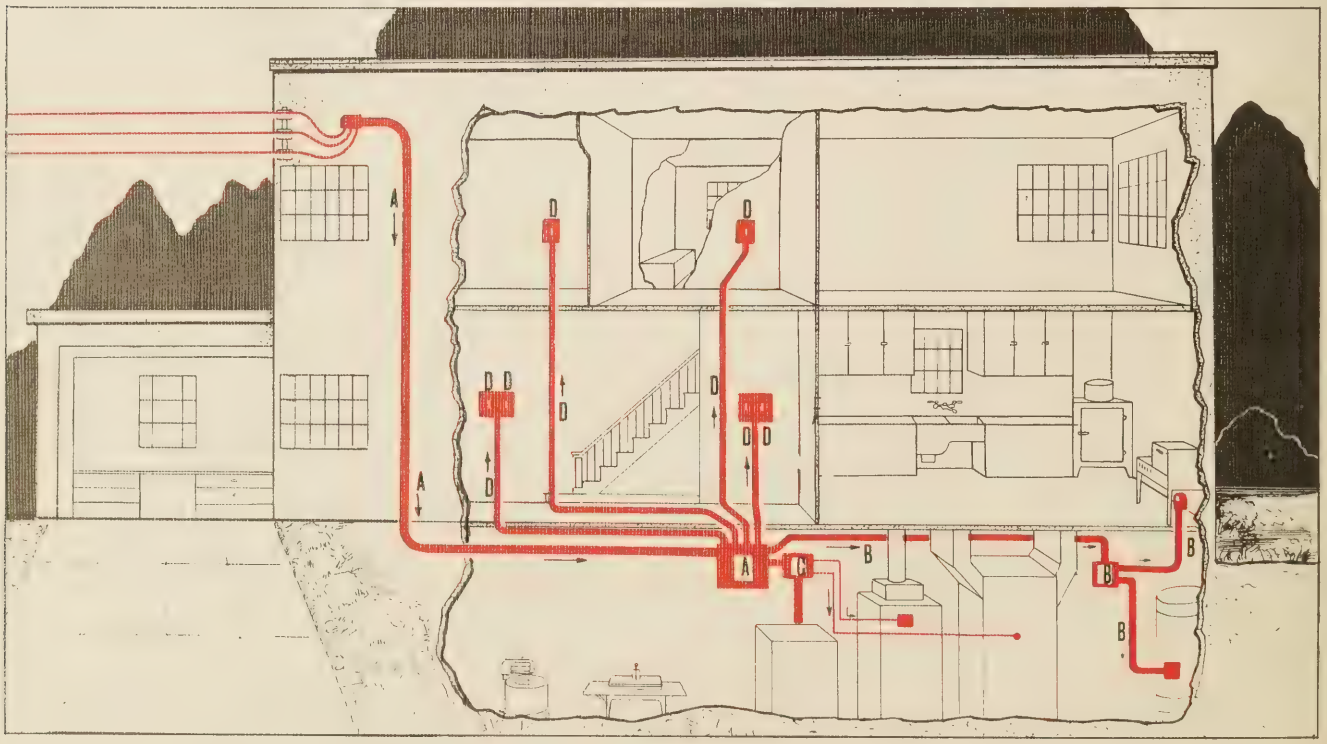
Here electricity is brought into the New American Home--a home designed for the comfort and convenience of modern families. The correct wire size was determined by considering the major fixed appliances to be used. The wires run from the pole to the house through the electric meter and on to the totalizing unit. At this point the total power required for the home is controlled. (See A.)



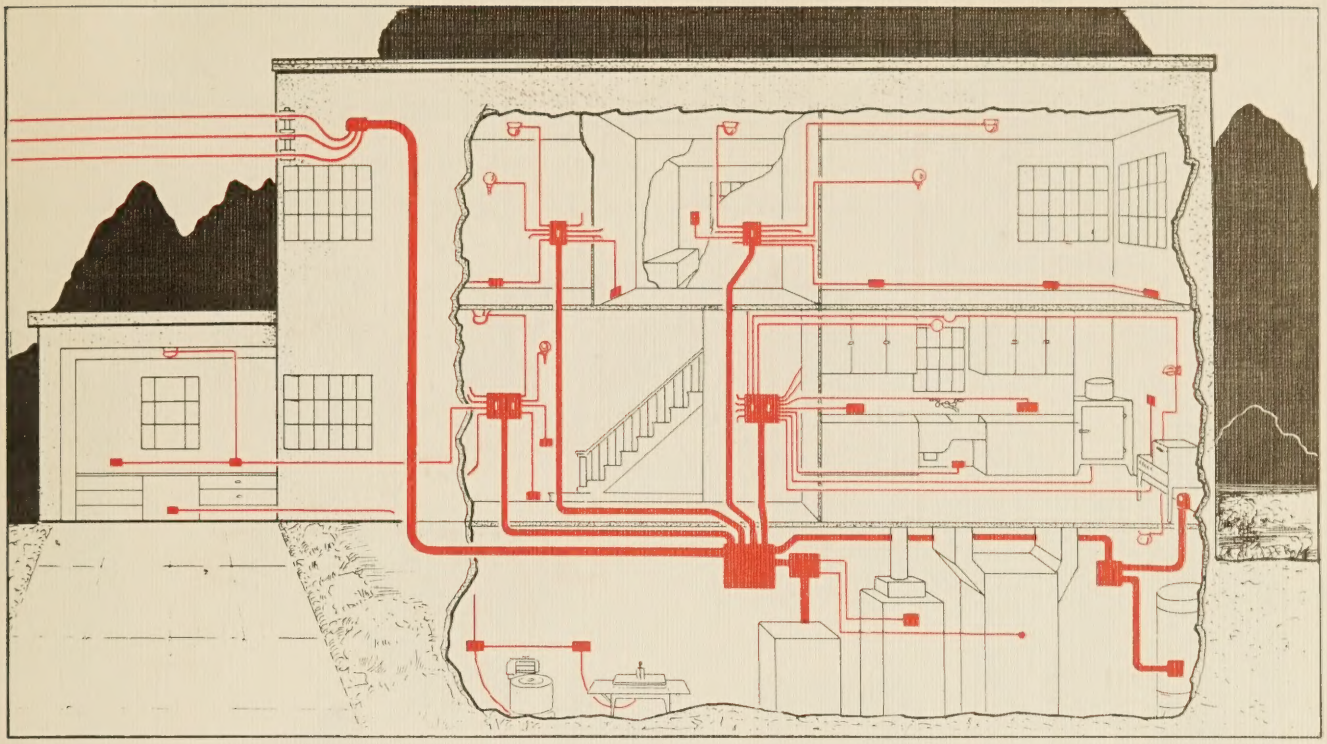
In wiring the fixed equipment, we consider the requirements for that particular appliance. The correct cable size is determined and run to the electric range and water heater. Using in this instance a water heater of the storage type, the same wires are used for it as for the range. The air conditioning equipment also in the category of fixed equipment and being used at any and all times, requires a special circuit. Thus, the proper power cables are run from the totalizing unit to the air conditioner. (See B and C.)



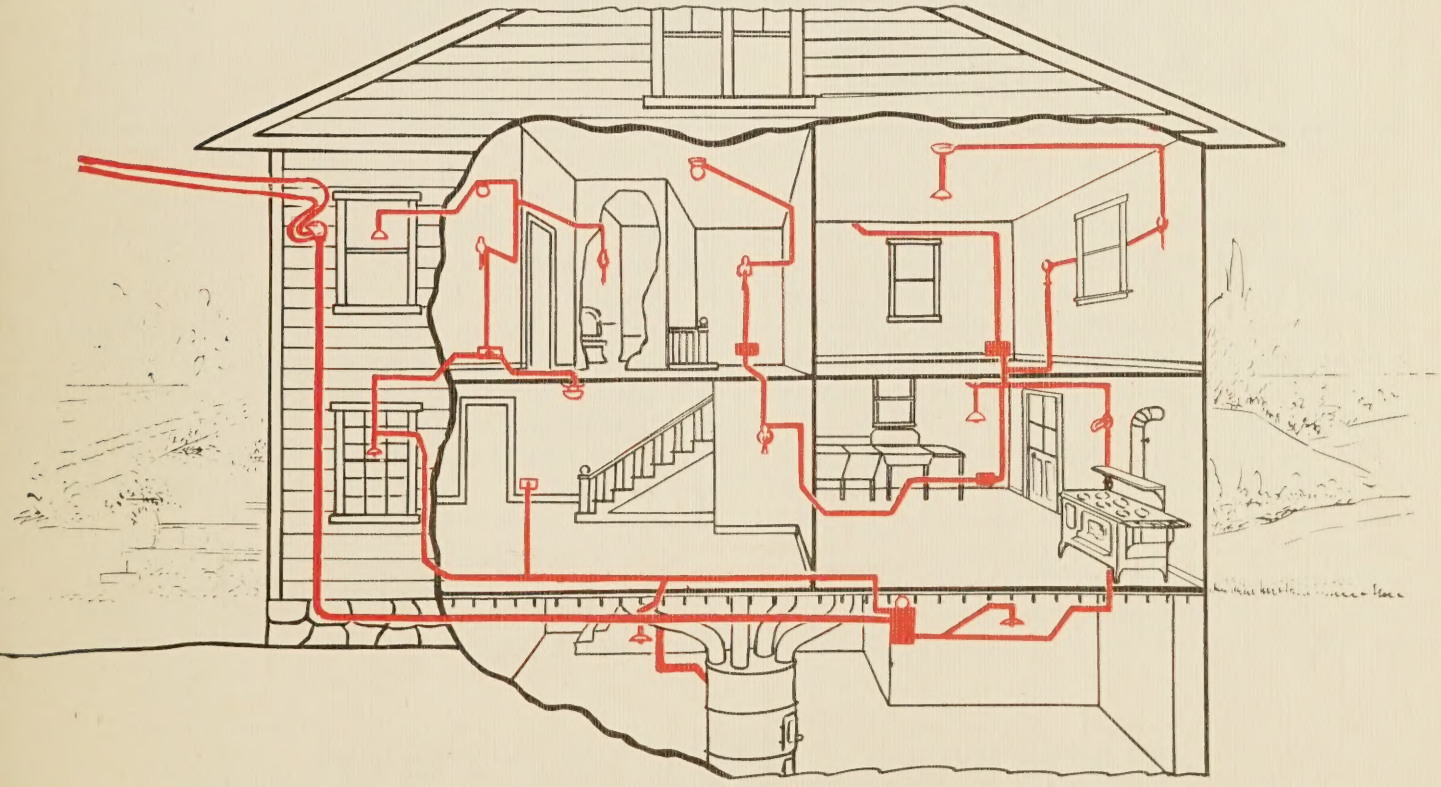
Secondary feeder lines are now run just as far as possible from the main source—the totalizing unit. In this particular home, four main feeders are used. From these feeder lines the eventual circuits are run through control units as shown in the next drawing. (See D.)



At the end of these secondary feeder lines, a new small circuit breaker for residential application is used. These circuit breakers are the control units for the final circuits. This satisfies National Electrical Code requirements for the control of units at the end of the feeders. (See D.)

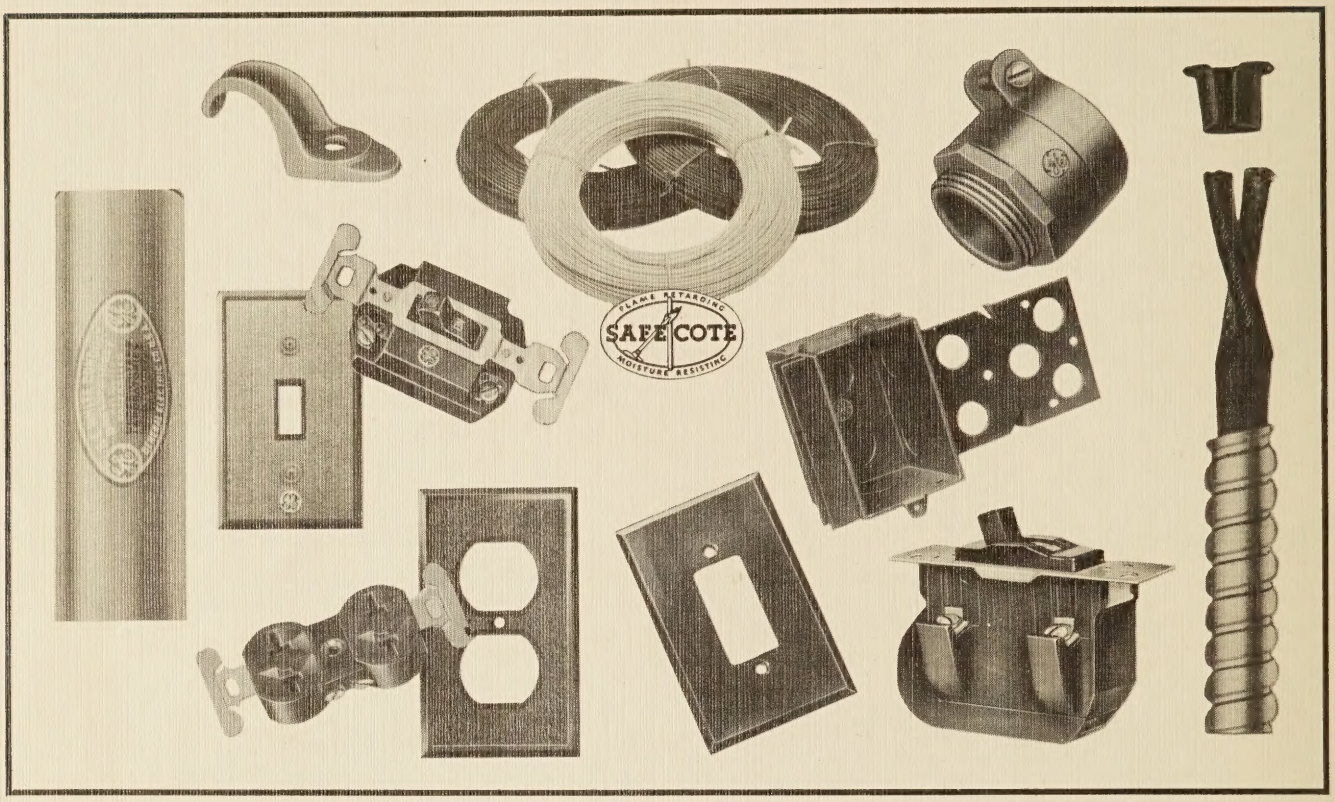


From the four points where the circuit breakers are located, we fan out for short distances local to each breaker. Thus, long runs are unnecessary. The new General Electric Radial Wiring System is complete.



Here we have an Old Type Wiring System. The inadequacy of this system compared with the G-E Radial Wiring System is obvious, yet it is still very common. Notice the circuits ambling through the house, the long runs and the practice of putting everything on the same circuit—ceiling outlets, wall brackets; convenience outlets.

These G-E Wiring Materials
Make G-E Radial Wiring Systems Possible



G-E WIRING MATERIALS satisfy the requirements of full electrical convenience, adequacy and flexibility necessary to modern, "all-electric" homes. They meet all specifications in the planning of small homes or palatial mansions. New designs, applications and functions of these Wiring Materials made possible the development of G-E Radial Wiring Systems.

The new G-E Circuit Breaker is the heart of the Radial Wiring System. In appearance, it resembles a flush tumbler switch and plate. This Circuit Breaker provides localized control and access to circuits at convenient points throughout the building. It is rated 15, 20, 25 and 30 amperes. Circuits opened by overloads are re-established quickly and easily. The searching for and replacing of blown fuses in the cellar or other out-of-the-way places is eliminated.

These basic G-E Wiring Materials make up the Radial Wiring System: G-E "Safecote" Building Wire; White Rigid Conduit, BX Armored Cable, their Boxes and Fittings; Circuit Breakers, Switches, Convenience Outlets and their Plates.

G-E Wiring Materials are designed and engineered for use together . . . built to give long, trouble-free service . . . are available everywhere.

Send for catalogs giving the detailed specifications of all these G-E Products. Write Section W51534, Merchandise Department, General Electric Company, Bridgeport, Connecticut.

GENERAL ELECTRIC

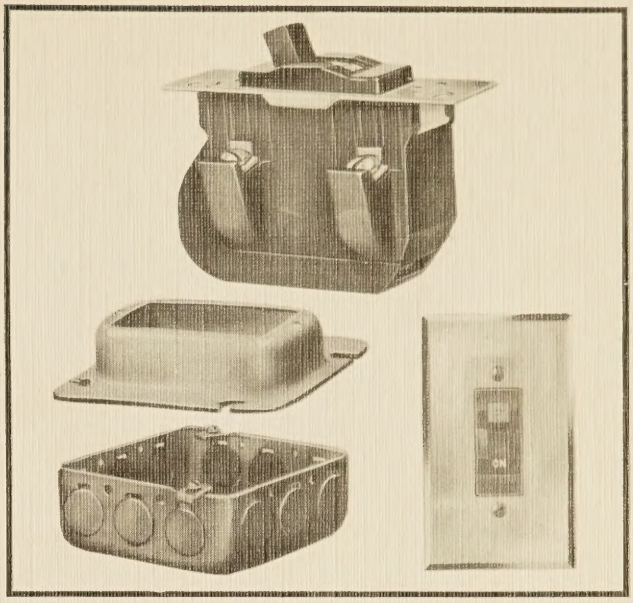
WIRING MATERIALS

NEW PRIMARY CIRCUIT BREAKER

Only standard parts are necessary for a Primary Circuit Breaker installation. When completely installed the circuit breaker resembles an ordinary switch in appearance. Specifications of products illustrated:

	Cat. No.	Desc.	Rating
Circuit Breaker.....	GB115	S.P.	15 Amp 125 V
Box (1 in. deep).....	SP52151	Single Gang for 1 Breaker	
Cover.....	SP52C15	To fit above box	
Flush Plate (Standard dimensions).....	GB61	Single Gang for 1 Breaker	

Other breakers are rated at 20, 25 and 30 amp. Two-, three- and four-gang-boxes, covers and plates are available for installing two-, three-, or four-circuit breakers in one bank.



CHECK LIST OF GENERAL ELECTRIC WIRING MATERIALS

WIRE AND CABLE

Safecote

Moisture-resisting, flame-retarding Code Wire. All sizes, solid and stranded, single and multiple conductors, Code, Intermediate or 30% grade, 600 volts or less.

Leaded Cables

All sizes, solid and stranded, single and multiple conductors, Code, Intermediate, or 30% grade, 600 volts or less.

CONDUIT PRODUCTS

Armored Conductors ("BX"), Flexible Conduit, and Fittings
Concrete Boxes and Back Plates
Conduit Bodies ("Spraguelets") and Fittings
Electrical Metallic Tubing, Oval Tubing and Fittings
Floor Boxes and Accessories
Non-metallic Sheathed Cable ("BraidX") and Fittings
Outlet Boxes, Covers and Fittings
Rigid Conduit ("G-E White" and "G-E Black") and Fittings
Service Entrance Cable
Switch Boxes
Underfloor Duct ("G-E Fiberduct") and Fittings
Miscellaneous Fittings

WIRING DEVICES

Bell Ringers
Bull's-eyes
Cutouts
  Enclosed Fuse
  Fuse Plug
Fuses
Fuse Links, Renewable
Fuse Plugs
Lampholders
  Brass Shell, Interchangeable
  Heavy Duty
  Intermediate
  Locking
  Lumiline
  Miniature
  Mogul
  Outlet Box
  Porcelain, Interchangeable
  Textolite
  Weatherproof
Outlets, Clock Hanger
Outlets, Convenience
Outlets, Fan Hanger
Outlets, Floor
Outlets, Outdoor
Outlets, Range
Pilot Lamp Receptacles
Plates, Flush
  Combination
  Disappearing Door
  Special and Accessories
  Standard
Plugs
  Attachment
Plug Receptacles
  Conduit Box
  Disappearing Door
  Industrial
  Polarity
Switches
  Automatic Door
  Canopy
  Combination
  Entrance
  Fan, Ceiling
  Flush Tumbler
  Motor Control
  Panel
  Pendent, Push-through
  Pull, Fluted-catch
  Surface
  Momentary Contact Push Button
  Pull (Ceiling)
  Rotary
  Tumbler
Tumbler, Heavy Duty
Timesaver Line
Terminals, Copper Cable
Transformers
  Bell Ringers
"Unicords"

GENERAL ELECTRIC

WIRING MATERIALS

APPLIANCE AND MERCHANDISE DEPT., BRIDGEPORT, CONN.

51-534-4

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